Introduction

Background

Biomedical research facilities are a critical component of the nation's science and engineering (S&E) research system. The availability and condition of biomedical research space directly affect the scope and quality of the biomedical research conducted at the nation's colleges, universities, medical schools, hospitals, and other research organizations. Numerous Congressional committees have expressed concerns about the quality of S&E facilities and the costs of maintaining them. Hearings held in both House and Senate committees on science and technology in the mid-1980s led to the conclusion that the condition of research facilities posed a "serious and ongoing problem. . . ."

To address the need for information on the amount and quality of S&E research space, Congress mandated that the National Science Foundation (NSF) gather this information and report it to Congress:

> *The National Science Foundation is authorized to design, establish, and maintain a data collection and analysis capability in the Foundation for the purpose of identifying and assessing the research facilities needs of universities and colleges. The needs of universities by major field of science and engineering, for construction and modernization of research laboratories, including fixed equipment and major research equipment, shall be documented. University expenditures for the construction and modernization of research facilities, the sources of funds, and other appropriate data shall be collected and analyzed. The Foundation, in conjunction with other appropriate Federal agencies, shall report the results to the Congress. The first report shall be submitted to the Congress by September 1, 1986.* (42 U.S.C. 1986)

Since 1986, NSF and NIH have collected data on a biennial basis to address these concerns of Congress. The first study, a "quick response" survey, provided limited data regarding biomedical facilities issues. In 1988, 1990, 1992, 1994, and 1996, full scale surveys have provided considerable information about the nation's research facilities.

This report describes the findings from the 1996 Survey of Scientific and Engineering Research Facilities at Colleges and Universities and places them in historical context by comparing results with those from earlier surveys.

The Survey and its Design

The 1996 Survey of Scientific and Engineering Research Facilities at Colleges and Universities, like earlier efforts, collected data on the amount of S&E research space in the nation's higher education institutions, the adequacy and condition of this space, the extent to which universities and colleges were constructing facilities and repairing/renovating space, and the funding of this activity.

Since the survey was initiated in 1986, attention has focused on providing trends on issues related to biomedical research space. Slight changes have been made to the survey, however, in each of the data collection cycles. In 1996, the survey included questions to determine need for additional biomedical research space as well as the need to repair or renovate existing space. The wording of some questions was also modified, as well as possible responses. These changes were made in response to new concerns of NSF, NIH, and Congress, as well as to concerns of institutional respondents and advisory panel members representing the higher education and research communities.

The college/university sample for the 1996 survey represents a universe of approximately 560 institutions. These institutions include all colleges and universities with research and development (R&D) expenditures of $50,000 or more as well as Historically Black Colleges and Universities (HBCUs) with any R&D expenditures.[1] In addition, a sample of over 200 hospitals and nonprofit research organizations that received extramural research funding for biomedical research from NIH in fiscal year 1992 also were included in the study. The total survey sample represented a universe of 780 institutions with more than $50,000 in research and development (R&D) as well as HBCUs with any R&D expenditures.

The 1996 survey was mailed to the college and university sample in early fall of 1995 and to the research organizations and hospitals in mid November. Extensive telephone follow-up elicited a high response rate and resolved questions regarding responses. Sampled institutions that participated in the 1994 survey were also sent a computer-generated “facsimile” of their previous responses. Overall, 96 percent of all sampled institutions completed the survey.

[1] The first two cycles of the survey, 1986 and 1988, included only 29 HBCUs. Based on additional information not available when the first two surveys were conducted, the sample for the 1992, 1994, and 1996 studies was expanded to represent an enlarged group of 70 research-performing HBCUs.

The Report

The Status of Biomedical Research Facilities: 1996 focuses on biomedical research facilities — those facilities located in the biological and medical sciences. Biomedical research facilities are not only located at academic institutions, but also are located in hospitals and nonprofit research organizations. This report is one of two major reports presenting findings from the 1988, 1990, 1992, 1994, and 1996 surveys. A companion report produced for Congress by NSF, *Scientific and Engineering Research Facilities at Colleges and Universities: 1996,* presents findings that are limited to academic institutions and do not focus on biomedical research facilities specifically.

The 1996 NIH report follows a similar format to the NSF report with each chapter organized around the following sections:

Highlights, a summary of key findings;

Data Considerations, a presentation of data limitations or interpretations; and

Findings, tables, graphs, and text that address issues pertaining to the state of biomedical research facilities in the United States.

This report provides information similar to that presented in previous reports, particularly data pertaining to trends in the amount, condition, capital activity, and funding of biomedical research space, as well as a profile of HBCUs.

Chapter 1 presents findings on the amount of biomedical research space available in academic and nonacademic settings. Chapter 2 examines the condition and adequacy of biomedical research space as assessed by institutions. Chapter 3 provides information on the costs in constant dollars of constructing facilities and repairing/renovating biomedical research facilities. The sources of funds for these capital projects are presented in Chapter 4. Chapter 5 is new to the NIH report and focuses on deferred construction and repair/renovation in biomedical research facilities. Chapter 6 provides a profile of HBCUs, and Chapter 7 discusses the condition of animal research facilities within biomedical research space.

Interested readers can turn to Appendix A, Technical Notes, for additional material about the study design, methodology, and selected standard errors. Appendix B contains the survey instrument.